# Algae Answers

### Algae not work

#### Algae is unproven and unfeasible.

The Oil Drum ’08 [“Biofuel Conference Call Including a New Biodiesel from Algae,” August 22, http://www.theoildrum.com/node/4439#more]

In some ways, the Solazyme approach is not too different from an ethanol approach. With ethanol, yeast often acts on corn or biomass feedstock to provide alcohol as an output. With this approach, it is algae that acts on biomass, to provide an oil as an output. Solazyme claims that it has been able to produce biodiesel fuel that meets the standards for Number 2 diesel fuel. They claim that the fuel they produce can be used at 100% concentration, year around, without problems. I believe that the tests they have run were in only one vehicle, for one year. It seems to me that more tests would be needed to show the limitations of the fuel. For example, do microorganisms grow in the fuel, and cause the problems in the tank after a couple of years? Solazyme claims that the process they have developed can be scaled up fairly quickly. They have tried to make the process as compatible with existing equipment as possible. The oils they have made to date have been made on large scale equipment owned by someone else, using short production runs. If they leased the equipment full time, or built their own facility, they claim they could make the oil in quantity. Whether or not this can be done needs to be proven, because collecting and processing adequate biomass for any biofuel operation is challenging.

### Algae not solve

#### Algae cannot be produced at the scale needed for U.S. consumption.

The Oil Drum ’08 [“Biofuel Conference Call Including a New Biodiesel from Algae,” August 22, http://www.theoildrum.com/node/4439#more]

Regarding whether this could be a panacea, there are still a lot of obstacles in the way. The process is only at a developmental stage, and hasn't been tested at scale. Also, the total amount of biomass available in the US isn't necessarily all that great, if one starts burning it for fuel in vehicles. We are basically using the same biomass to replenish our soil; to provide wood for heating homes; to provide biomass for fueling electric power plants; to provide feedstock for cellulosic ethanol and now to provide feedstock for algal diesel as well. There is clearly not enough biomass to do all of these things at the scale some might like, simultaneously.

#### Algae is under-researched, not economical, and not proven on a large scale.

Sapling 12/18/08 [TheEnvironmentSite.org, “Algenol,” http://www.theenvironmentsite.org/forum/biofuel-forum/14476-algenol.html]

Another reason could be it would be more difficult to check it out in Mexico. I have no idea why you would assume the permitting process is easier in Mexico. They are going to be using photo bioreactors (PBR) made of plastic. The size of the proposed farm is 102,000 acres, or 156 square miles or 2.3 times the size of Washington DC! Their PBRs are sealed so they need some sort of piping and pumping system to get CO2 and nutrients in and another set of tubing to collect condensed ethanol. This is a lot of material. And it has to be maintained and repaired in the blistering hot sun. Look at the state of algae research on the DOE’s NREL website. Look at the state of the USAF/DOE program. The Algae Biomass Organization shows only a handful of peer reviewed documents on algae and all of them are about CO2abatement, none are about fuel. I’m not saying algae fuel can’t be done, I’m saying it can’t be done economically and has not been proven on a large scale.

#### The promise of algae ethanol is nothing more than a scam.

Sapling 12/18/08 [TheEnvironmentSite.org, “Algenol,” http://www.theenvironmentsite.org/forum/biofuel-forum/14476-algenol.html]

Come on use the internet for something other than porn. This algae thing is a scam. When gas was over $4.00 a gallon just a few months ago, Algenol said their fuel would be "about $3.00 or $1.00 less than fuel today". Now it's, “can sell ethanol at a price that is cheaper than any other fuel all across the United States”. So they’ve managed to cut their prices in half magically? Their magical alga also desalinates water? Do some research on biological desalination. It does not exist! Most desalination plants use reverse osmosis and spend big money using chemicals to kill algae! What do they do with the salt? Desalination plants pay big bucks to get rid of it. I assume they process it into pixie dust and sell it to Disney. And their magical algae doesn’t need harvesting, they just collect condensed ethanol vapors??? OK let’s pretend that’s so. So the algae, that grows much faster than conventional crops, never needs to be removed from the photo bioreactors and never dies? O-K. Google “Biofields S.A.P.I de .C.V” and you find nothing other than discussion of the Algenol deal. Do that search and omit “Algenol” and “850” and you get one page of hits and they all still only relate to them building a plant in the desert. Where does a two year old company that hasn’t ever done anything get $1 billion dollars! It’s too bad there are no real journalists anymore. They just print what sells and nonsense like this sells. These guys are going to soak up the government money for alternative fuels. That would be cool if they were going to do real research and actually produce something. I fear this will not be the case. They are betting on some nonsensical carbon trading law and money from our wise elected officials in DC.

### Algae not solve – no infrastructure

#### Despite any potential, no infrastructure or consistent method for developing algal biofuels.

CNET News, byline Michael Kanellos, 8-23-2007, “The challenge of algae fuel: An expert speaks,” http://news.cnet.com/8301-10784\_3-9765452-7.html MH

Right now, though, no one is producing it commercially. Companies such as LiveFuels, GreenFuel Technologies and Solazyme hope to start seeing algae oil get into the fuel markets in a substantial way over the next few years, but it's still mostly experimental. GreenFuel recently hit some snags and changed CEOs. One challenge is removing the water. It's not uncommon to have 1 gram of usable algae in every liter of water. "That's 1,000 parts of water for every part of algae," he said. The industry is also in the midst of a few religious wars. One is controlled versus open ponds. In controlled facilities, engineers can regulate the growth of organisms and control what kinds of species grow in the environment. These facilities cost quite a bit. Controlling the rate of growth can also be a problem. "Open ponds are the cheapest, simplest solution," he said. "But it is much harder to maintain consistency." Then there is the question of using biologically enhanced organisms or a mixture of naturally occurring species. Enhanced organisms can produce more oil per cell. However, they may not thrive if foreign species enter the pond.

#### More evidence on this question.

U.S. News & World Report, byline Katy Marquardt, 7-25-2008 “The Next Generation of Alternative Energy”, http://www.usnews.com/articles/business/technology/2008/07/25/the-next-generation-of-alternative-energy.html MH

How about algae-powered jets? Airbus and Honeywell recently announced that they're developing a jet fuel using vegetation- and algae-based oils that could power a third of commercial aircraft by 2030. Other heavyweights, including Boeing, Virgin Atlantic, Chevron, and Royal Dutch Shell, are exploring algae's potential. The key challenge, says Ed Guinness of the Guinness Atkinson Alternative Energy fund, is slashing the cost of production. "You've got to grow it at a low enough cost so that you can take advantage of the high yield," he says. He says it will probably be eight to 10 years before algae go commercial.

#### Even if algae biofuels are developed - Commercial production wont be available until at least 2012

Jeffrey Ball, 6-11-2008, The Wall Street Journal, “Winging It: Airlines Struggle With Soaring Fuel Prices”, http://blogs.wsj.com/environmentalcapital/2008/06/11/winging-it-airlines-struggle-with-soaring-fuel-prices/ MH

But airplanes are pretty much stuck on the ground without oil-based fuels. Most of the bio-alternatives that work on the ground don’t work in the air. Some of them, like ethanol, have the potential of freezing in mid-air. Few pack the energy per gallon needed to fly—airplanes have limited space for fuel, so whatever they use must have high-energy content. So far, electricity is out of the question for the larger commercial jets. The U.S. military has been experimenting with alternative fuels, and says it has had encouraging test results, but that’s doesn’t help commercial airlines today. To come up with alternatives to oil-based jet fuel, the airline industry teamed with airports and the federal aviation administration in 2006 to form the Commercial Aviation Alternative Fuels Initiative. They are making headway, with a fuel made from biomass and coal up for certification this year. But production wouldn’t hit the market until 2012 or 2013, and it would only supply a small piece of total demand. “Unfortunately it takes a long time to come up with new fuels,” says Richard Altman, who heads CAAFI. In the meantime, airlines are giving a second-look to fuel-saving methods they wouldn’t have considered just a few years ago, such as washing the grit inside plane engines, a practice that can reduce fuel consumption

### Algae not solve – oil

#### Even if they find a way to economically produce algae biofuels, it won’t solve.

Benemann ’07, Manager of the International Network on Biofixation of Carbon Dioxide and Greenhouse Gas Abatement with Microalgae (operated by the Int. Energy Agency, Greenhouse Gas R&D Programme) and also as a researcher in this field for over 30 years [John, “Algal Biodiesel: Fact or Fiction?,” http://i-r-squared.blogspot.com/2007/05/algal-biodiesel-fact-or-fiction.html]

12. Even if R&D proves successful and we can actually produce algae biofuels (maybe even biodiesel) economically (whatever the economics may be a decade or so from now), even then, I am sorry to say that due to resource (land, water, etc.) limitations, algae will not replace all our (or their) oil wells, cannot solve our entire global warming problem, or make me rich quick, at least not honestly. But maybe this technology could be developed in the next few years so that in the future it can make a contribution to our energy supplies, our environment and human welfare.

### Algae not solve – warming

#### No tech for algae now – takes up too much land and could be years before fully developed

Compare Gas & Electricity Prices | posted in News & Stories, Reviews | Date: March 28th, 2010, “Bio Fuel From Algae Creating More Problems Than A Solution?”, <http://www.keyframe5.com/bio-fuel-from-algae-creating-more-problems-than-a-solution/>

Algae are the fastest growing plant life and as the organism that can convert sunlight into oil. Scientists theorize algae bio fuel can produce about 30 times more energy per acre than any other bio fuel options. The US Department Of Energy has estimated that if algae bio fuel replaces all conventional fuel in the country, bio fuel algae will require about 15,000 mi.² of land to harvest algae. Which is 1/7 of all the land that are currently use to produce corn each year with the diverse group of bio products such as Dog Food, and plastic could be created with in-house bio fuel operation making those productions more cost-effective. Before we head out to start celebrating the bio fuel solutions, there are a few problems. The biomass for producing a significant amount of algae bio fuel does not yet exist. The algae have to be grown from scratch and harvesting algae bio fuel is still very expensive at this time. The potential of algae bio fuel is amazing but the problem is right now it’s all just potential. It might be many years before this technology make it possible to produce algae bio fuel in a large-scale at affordable price. When that time come, we might finally be ready to celebrate more efficient, renewable and environmentally friendly energy source.

### Algae – not popular

#### 4. The genetically modified algae necessary for large-scale production will be rejected by the public. Claims that algenol is “coming soon” are political cons.

Sapling 12/18/08 [TheEnvironmentSite.org, “Algenol,” http://www.theenvironmentsite.org/forum/biofuel-forum/14476-algenol.html]

If I were a “real” journalist, I would ask an independent company, NOT the people making the outrageous claims. I have no doubt the Algenol/Biofields spokesman would say they are the real deal, just like Bernie Madoff said his investment company was the real deal…$50 billion dollars later…not so real! Doesn’t Biofields say they signed a deal with PEMEX to sell their product? Wouldn’t seem hard for a journalist (who spoke Spanish) to confirm. Gents, anyone can become a corporation…all one has to do is have a check that clears. A couple of hundred bucks and I’m “PappaDaddy LLC”! Respectfully, comparing Biofuels to BP is like comparing apples to nylon rope. BP has a market cap of $155 billion. To invest $500 million over 10 years seems reasonable…for BP! They are one of the largest corporations in the world! Their 2005 advertising budget was $150 million. And notice that BP money is for research, NOT to build a specific plant using a specific process as Algenol claims.n Go to Algenol’s main page: 8. Does make fresh water from seawater during the process. Please address this. In June 2008 Paul Woods said the cost of his fuel would be about $3.00 a gallon. Now it’s cheaper than any other. Gas is about $1.55 here, so they’ve cut their production costs in half? Please address that. They use cute terms like “train” the algae and “coax” the algae to make ethanol. I expect soon they will be “imploring” the algae to do so. Their own patents use the term “genetically modified” (GM). Do you think anyone is just going to merrily allow GM algae to be introduced into an area, especially areas that make their living from the sea? Some web articles say the plant will be in Cabo San Lucas. That’s in the Mexican State of Baja California Sur. Cabo is a large tourist destination with no industry at the very bottom of the Baja Peninsula. Some say Puerto Libertad, Sonora, which is a small town with no industry, but there is proposed large development planned there. It includes a regasification plant, an oil pipeline, and a 4-lane highway so people can get there. There is even talk of large tourist developments and even a Formula One or NASCAR track. I see no independent confirmation of a plant being built there. If I was a Spanish speaking journalist, I would ask these state governments if they have given permits for a 102,000 acre algae farm to be built. I will crack that soon. I have done LOTS of research on these guys and they do not seem like the real deal. I WANT this to be true; I started researching alternative fuels a couple of years ago. I was especially interested in algae. The more I read the more it appears micro algae is not ready for prime time and most of these companies want to capitalize off of the carbon sequestration thing. Is it a coincidence they just hired the former minority counsel to the House Appropriations Committee and spent $140,000 lobbying Congress through the Breaux-Lott Leadership Group in 2008?